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POLISH  
And  
POULARD  
WHEATS



**POLISH AND POULARD WHEATS** are two distinct species or subspecies of wheat of rather striking appearance which often have been fraudulently exploited in this country under many different names.

False stories of the origin of these wheats usually have accompanied the offers of seed for sale at prices ranging from \$20 to \$60 per bushel.

The one variety of Polish wheat grown in this country, White Polish, bears a resemblance to rye and has sometimes been wrongly sold as a variety of "giant" rye. It can be grown only in the spring-wheat region, and there it seldom yields more than half or two-thirds as much as other varieties. It is not used in the manufacture of bread-making flours or semolina products, such as macaroni and spaghetti.

Four varieties of poulard wheat have been grown in the United States in recent years, three of which have branched or composite heads. The Alaska is the best known and most widely exploited variety. Poulard wheat usually produces low yields and is not suitable for making flour or semolina.

Farmers are advised against buying and growing varieties of Polish and poulard wheat, as only unsatisfactory returns have been obtained from them in all parts of the United States.

# POLISH AND POULARD WHEATS.<sup>1</sup>

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## INTRODUCTION.

Man craves spectacular things even in a commonplace crop, such as wheat. Polish and poulard wheats are among our most spectacular cereal crops in appearance, and the stories which have accompanied the exploitation of these two grains would excite the interest of the most indifferent farmer. Neither of these wheats is of commercial value in America, but both have been offered many times and are still being offered to the buying public by unscrupulous or unknowing promoters who take advantage of their striking appearance.

This bulletin has been prepared to answer the frequent requests for information concerning the origin, productivity, and value of the varieties of Polish and poulard wheats grown in this country and to warn farmers against paying high prices for seed of these nearly worthless grains.

## POLISH WHEAT.

Polish wheat, known botanically as *Triticum polonicum* L., comprises a distinct species of the wheat genus and is strikingly different from the kinds commonly cultivated in this country.

## DESCRIPTION.

Polish wheat has large heads, frequently 6 or 7 inches in length and an inch or more in diameter (Fig. 1). The chaff is extremely long and rather thin and papery. The kernels are long, sometimes half an inch in length, and are very hard. In color and texture

<sup>1</sup>The information given in this bulletin is based upon (1) varietal experiments conducted by the Office of Cereal Investigations, Bureau of Plant Industry, United States Department of Agriculture, and the State agricultural experiment stations, either independently or in cooperation; (2) classification studies of all American wheat varieties; (3) a survey of the wheat varieties of the United States, in cooperation with the then Bureau of Crop Estimates, based upon 19,000 returns from 70,000 questionnaires sent to crop correspondents; (4) several years of personal observation by the writer of the wheat fields in the States where these varieties are grown; and (5) milling and baking experiments conducted by the Milling-Investigations Section of the Grain Division, Bureau of Agricultural Economics, in cooperation with the Office of Cereal Investigations, and also by the State agricultural experiment stations.



FIG. 1.—Head, chaff, and kernels of White Polish wheat. Head and chaff natural size; kernels magnified 3 diameters.

the kernels of the Polish wheat grown in this country resemble those of the amber durum wheats. In outward appearance the heads and kernels of Polish wheat are somewhat like rye, which accounts for its occasionally being sold as a variety of "giant" rye.

A number of varieties or forms of Polish wheat have been described in Europe, but only one is known to have been grown in the United States. This variety, White Polish, is grown and sold sometimes simply as Polish wheat, but more frequently under such fictitious names as Assyrian rye, Belgian rye, Corn wheat, German rye, Giant rye, Goose wheat, Jerusalem rye, Riee wheat, Siberian Cow wheat, and Wild Goose wheat. White Polish wheat has the general characteristics of Polish wheat mentioned above, viz, large, loose heads with long papery chaff and very long, hard white or amber kernels (Fig. 1). The plants are very tall, with nodding heads. The upper portions of the stems are solid or pithy. The chaff is glabrous, i. e., not velvety or hairy. The beards are black,  $1\frac{1}{2}$  to 6 inches long, and easily broken off at maturity. White Polish does not tiller well. It is a true spring wheat and will not survive the winter when sown in the fall except in the South or in those Pacific coast regions where the winter temperatures are mild. It is very susceptible to injury from stem and leaf rusts, and the heads are easily blasted by hot winds at flowering time.

#### HISTORY.

Polish wheat apparently was not grown in ancient times, but it has been known in Europe at least since 1681 and was early introduced into the United States. It was grown in Maryland as early as 1845, and many introductions of Polish wheat into this country have been made

since that date. The origin of the name "Polish" is obscure, as the wheat does not appear to have been grown in Poland until many years after its discovery. The crop is now sown to a slight extent in Abyssinia, Algeria, Argentina, Italy, Spain, Turkestan, the United States, and probably other countries. It is not an important crop in any of them.

Polish wheat has been grown within recent years in California, Colorado, Idaho, Montana, Nebraska, North Dakota, Oregon, South Dakota, and probably other Western States where spring wheat is grown. The most extensive exploitations in this country have been in Idaho and Montana. Seed has been sold at such high prices as \$1 a pound, or \$60 a bushel, with claims for enormous yields of the wheat.

#### ADAPTATION.

Polish wheat can be grown wherever other spring wheats are grown, but outside of the spring-wheat regions it is almost a complete failure. Under favorable conditions it usually yields about half to three-fourths as much as the standard varieties of wheat grown in the same places. In seven years' comparative trials at Dickinson, N. Dak., White Polish wheat produced an average acre yield of less than 14 bushels, while Kubanka durum wheat yielded 24 bushels per acre under the same conditions. At Bozeman, Mont., under irrigation, White Polish wheat yielded about three-fifths as much as Marquis spring wheat. At Newell, S. Dak., in two years' comparative trials, White Polish averaged 3.7 bushels per acre and Kubanka durum 11.5 bushels per acre. These results are typical of those obtained in other spring-wheat States on both farms and experiment stations.

Polish wheat is not well adapted to any part of the United States. Where it yields well, other varieties will yield better. Only the large size of heads and kernels of Polish wheat together with the fraudulent claims of those who sell the seed have saved the wheat from going completely out of cultivation, as satisfactory yields seldom are obtained.

Polish wheat has a low gluten content and the gluten is of poor quality. Bread made from it is of poor color and texture. The same quantity of flour from a good hard spring wheat produces a loaf of bread nearly twice as large as a loaf of bread from Polish wheat flour. Macaroni manufacturers will not use Polish wheat in the manufacture of their products. The only use for Polish wheat is as stock feed, and it possesses no advantages over other more productive wheats for this purpose. It doubtless is about equal to ordinary wheat in feeding value. There is no object in growing Polish wheat other than as a curiosity.

#### POULARD WHEAT.

Poulard wheat usually has been considered a distinct species or subspecies, but is more closely related to our ordinary cultivated wheats than is Polish wheat. In many characters it is somewhat intermediate between common and durum wheats. Botanically, poulard wheat is known as *Triticum turgidum* or *Triticum sativum turgidum*.

## DESCRIPTION.

Poulard wheat has tall, thick, pithy, or solid stems and broad leaves. The heads are long, thick, and compact and may be either branched (composite) or unbranched. Three of the four varieties of poulard wheat (Figs. 2 and 3) grown in this country have branched heads. The beards are 1 to 7 inches long and frequently break off at maturity. The chaff may be white or brown and either glabrous or velvety, depending upon the variety.

The kernels are rather short, thick, and humped. Under some conditions the kernels are hard and translucent, like durum wheats, but as usually grown the kernels are soft and chalky, due to "yellow berry." Some varieties have white (amber) and some have red kernels. The kernels are shorter but otherwise are similar to those of durum wheat and also slightly resemble those of club wheat. The simple or unbranched heads of varieties of poulard wheat are difficult to distinguish from heads of durum wheat (Fig. 3).

Both spring and winter varieties of poulard wheat are grown in this country. Poulard wheat is easily injured by rust and smut. The plants tiller poorly, so that thin stands often result from ordinary rates of seeding.

## HISTORY.

Poulard wheat is reported to have been found in ruins of the ancient lake dwellings of Switzerland and in ancient Egyptian tombs. The reports may not be authentic. It appears probable, however, that this wheat was grown in Europe at the beginning of the Christian Era, and it has been definitely known for nearly 400 years. A poulard wheat, apparently identical with the Alaska variety, was brought to the United States from Ireland in 1806. It appears to have been introduced on an earlier occasion, and many samples of poulard wheat have been received in this country since that time.

Poulard wheat is not an important crop in any country, but Spain, Portugal, and Italy lead in its production. Smaller quantities are grown in Abyssinia, Algeria, Argentina, Australia, Baluchistan, Bulgaria, Canada, Chile, England, France, Germany, Greece, Siberia, South Africa, Transcaucasia, Turkestan, Turkey, and the United States. In most sections poulard wheat is grown only sparingly. In England a variety called Rivet or Cone, having an unbranched head, is the one largely grown, but even this is of minor importance in comparison with the common bread-making wheats.

The growing of poulard wheat, principally the Alaska variety, has been attempted in most parts of the United States. In recent years it has been grown and exploited chiefly in the western half of the country. It is now grown there on a very small scale as a curiosity, or by those who wish to exploit it, or by those who have recently purchased it but have not yet learned its low value.

The distribution and sale of poulard wheat in the United States have resulted almost wholly from exaggerated claims of its yield and value made by ignorant or fraudulent dealers.

## ADAPTATION.

Poulard wheat is not well adapted to any part of the United States. Occasionally it produces rather high yields, but in no locality

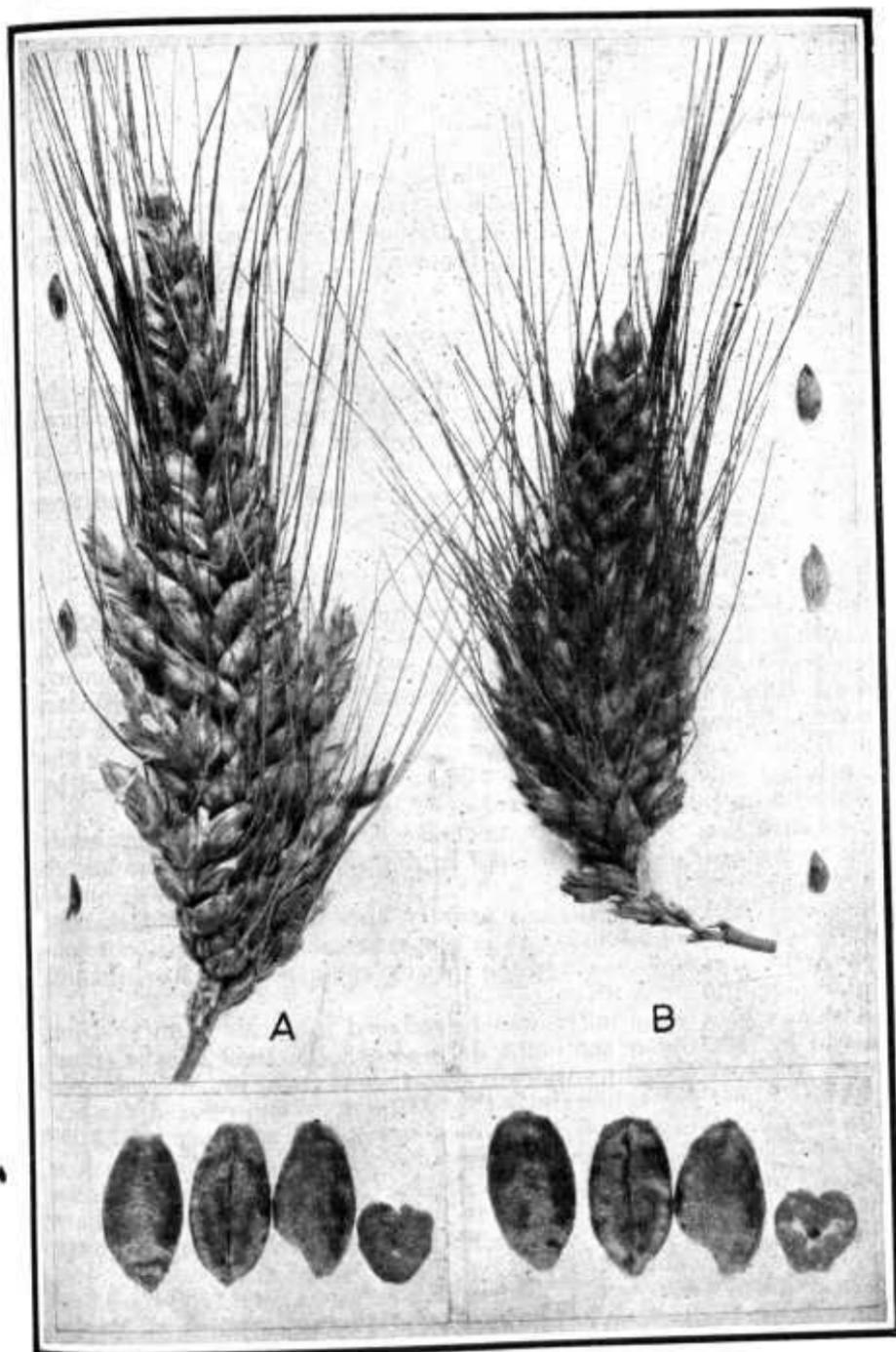


FIG. 2.—Heads, chaff, and kernels of Alaska (A) and Titanic (B) poulard wheats.  
Heads and chaff natural size; kernels magnified 3 diameters.

have the yields equaled those of adapted varieties of club, common, or durum wheat grown under the same conditions. Comparative yields of the varieties of poulard and other wheats are given later.

In baking quality the varieties of poulard wheat are poorer than any of the commercial wheats grown in this country, including all common, club, and durum varieties. Loaves of bread from poulard wheat usually are about half to two-thirds as large as loaves made from an equal quantity of flour of the standard varieties of wheat. Millers will not knowingly purchase poulard wheat for flour-making purposes or for making semolina to be used in macaroni manufacture. Poulard wheat is suitable only for stock feed, and as such it is not superior to other kinds of wheat.

#### VARIETIES.

A large number of varieties of poulard wheat have been described by European writers. Several varieties have been introduced into the United States, but only four of them are known to have been commercially grown. Of these four, which are described later, only one, Alaska, has ever been grown on a considerable scale, and even this has been limited to a few hundred acres annually.

#### ALASKA.

The Alaska variety has been known by all of the following names: Canadian King, Egyptian, El Dorado, Jerusalem, Many-Headed, Many-Spiked, Multiple-Headed, Miracle, Mortgage Lifter, Mummy, Reed, Russian Rhycoff, Seven-Headed, Seven-Headed Sinner, Smyrna, Syrian, Taos, Wheat of Miracle, Wheat 3,000 Years Old, and Wild Goose. Many of these names have arisen because of the branched heads of this wheat. The other names were applied by those who invented mythical stories of its origin.

Alaska wheat has large branched (composite), nodding heads with long black beards. The chaff is glabrous (not velvety or hairy) and of a yellowish color (Fig. 2, A). The kernels are white or amber and sometimes hard, although usually appearing soft and starchy because of "yellow berry." It is a spring wheat and will not survive the winters when sown in the fall, except in sections having mild winter temperatures.

Alaska wheat apparently was introduced into this country from Ireland in 1806 under the name Jerusalem.<sup>2</sup> In 1840 Alaska wheat grown in South Carolina was advertised in a farm journal and sold at \$5 per head. At other times this wheat has been offered for sale as having been discovered in an ancient tomb or mummy case 3,000 or 4,000 years old. As wheat loses its vitality within 20 years, it is readily seen that these stories are false. On other occasions Alaska wheat (and several other kinds as well) has been claimed to have originated from a grain found in the crop of a wild goose which the advertiser or some one else had shot.

The name Alaska was applied to this wheat about 1908 by Abraham Adams, of Juliaetta, Idaho, who claimed enormous yields for the wheat and sold the seed at \$20 per bushel.

<sup>2</sup> For a more complete history of Alaska wheat, see United States Department of Agriculture Bulletin No. 357, Alaska and Stoner, or "Miracle," Wheats: Two Varieties Much Misrepresented.

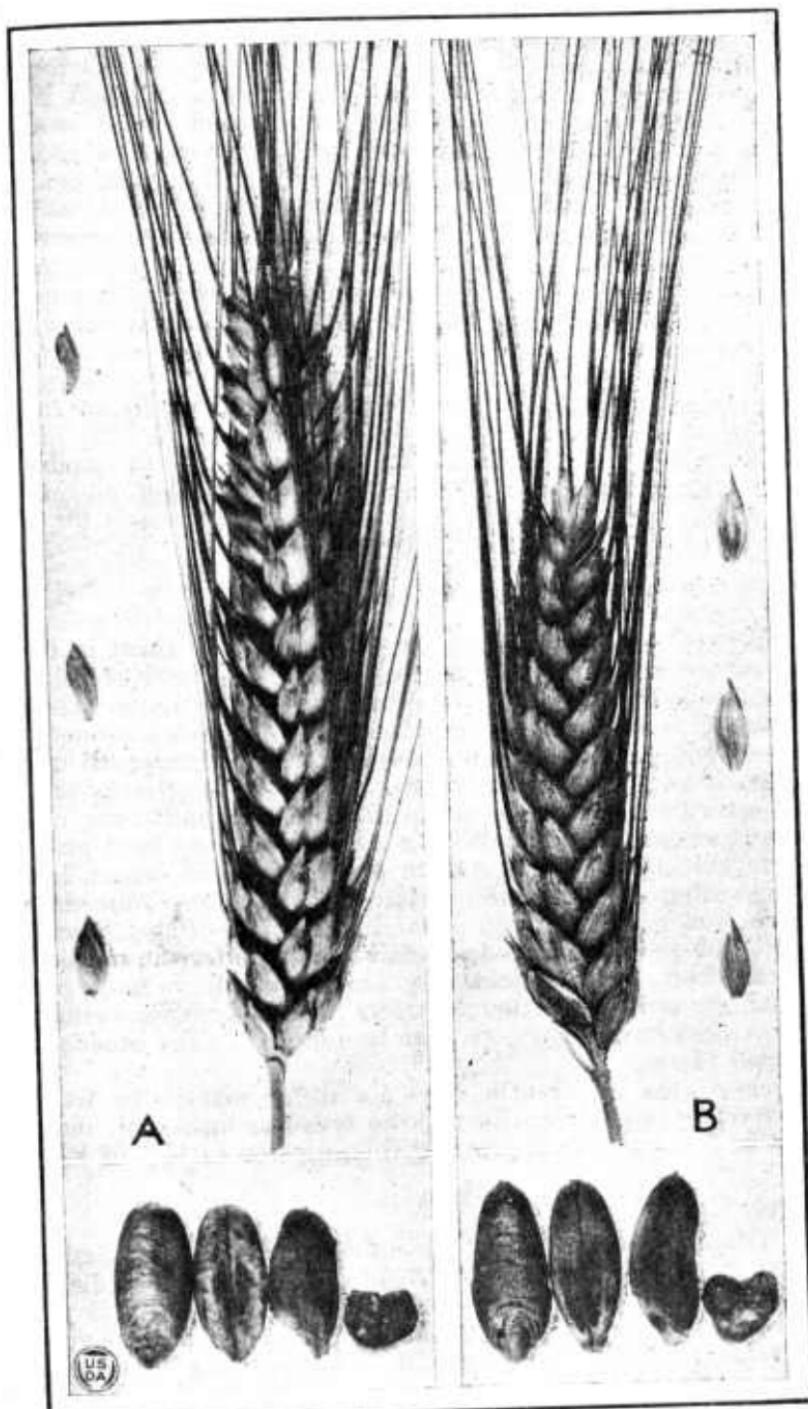


FIG. 3.—Heads, chaff, and kernels of Clackamas poulard wheat (A) and Peliss durum wheat (B). Heads and chaff natural size; kernels magnified 3 diameters.

Alaska wheat under various names has been grown in many of the Western States in recent years. Usually the wheat has been discarded after a brief trial.

In experiments covering six years at Dickinson, N. Dak., Alaska wheat produced an average yield of about 14 bushels per acre and Kubanka durum wheat 24 bushels per acre. At Newell, S. Dak., the 4-year average yield of Alaska was 9 bushels and of Kubanka 16 bushels per acre. Similar or poorer results have been obtained elsewhere. In many cases the yields have been little more or even less than the quantity of seed sown. Rarely, if ever, does the Alaska wheat yield as much as the standard varieties grown in the same districts, and in most instances the yields of Alaska are far below those of the best varieties. The branched heads of Alaska wheat contain more kernels than the unbranched heads of ordinary varieties, but as there are far fewer heads per acre the yields naturally are less.

The statements made previously in regard to the quality of poulard wheat apply fully to the Alaska variety. It is not suitable for bread-making or macaroni-making purposes. Being an inferior wheat in both yield and quality there is no logical reason for growing Alaska wheat anywhere in the United States.

#### WINTER ALASKA.

The Winter Alaska variety differs from Alaska wheat in having brown velvety or hairy chaff and red kernels, instead of yellowish white glabrous chaff and white or amber kernels. Winter Alaska is a true winter wheat and can not ordinarily be grown from spring sowing, like Alaska. Winter Alaska has large branched or composite heads with long black beards. It is not very hardy and can not be grown except under moderate climatic conditions.

Poulard wheat similar to Winter Alaska has long been grown in Europe. Doubtless Winter Alaska is of European origin, but the facts regarding its introduction have not been determined. The variety is now grown only on a small scale in the Puget Sound section of Washington. It produces fair yields under the mild humid conditions there, but the yields are below those of the more productive varieties grown in that district. Limited experiments with Winter Alaska have not shown it to be adapted to any other part of the United States.

Winter Alaska apparently does not differ materially from the Alaska variety in its value for making bread or macaroni, and there appears to be no object in growing this inferior variety of wheat.

#### TITANIC.

The Titanic variety is nearly identical with Winter Alaska, except that it has white or amber instead of red kernels. A head and kernels of Titanic wheat are shown in Figure 2, B. This variety was introduced into the United States in 1912 by Harry Towell, of Port Stanley, Wash. Mr. Towell, a survivor of the Titanic marine disaster, brought over 12 kernels of the wheat which had been obtained from a friend in England. The wheat was said to have been imported into England from Argentina. The Titanic variety was first grown and increased on Whidby Island in Washington. A

small quantity was distributed from there in 1916, when the seed was offered for sale at \$1 a pound. It is not known to be grown to any extent at the present time.

Titanic wheat has produced very low yields in comparison with standard varieties of bread-making wheats. At Chico, Calif., the 2-year average yield of Titanic was 20.8 bushels per acre, while Pacific Bluestem and White Federation, two white common varieties, yielded 28.2 bushels and 43.4 bushels per acre, respectively. Similar or poorer results with Titanic wheat have been obtained elsewhere. In bread-making value this variety is as poor as Alaska. It should not be grown in this country.

#### **CLACKAMAS.**

The Clackamas (Clackamas Wonder) variety differs from the other three varieties of poulard wheat previously discussed in having simple or unbranched heads. The heads are long, thick, and nodding (Fig. 3, A). The chaff is yellowish white and glabrous, with the edges bluish black and sometimes velvety or hairy. The beards are long and black. The kernels are red and are somewhat larger than those of the other poulard varieties just described. The heads of Clackamas wheat are larger but otherwise quite similar to the Peliss variety of durum wheat (Fig. 3, B), but Clackamas differs from Peliss in having shorter and thicker red kernels and shorter chaff and in being taller and later.

Clackamas as grown on the farms is not pure but contains several types of poulard wheat having unbranched heads as well as some mixtures of common wheat. It is a spring wheat and can not be grown from fall sowing except in districts having a mild climate.

Poulard wheats similar to Clackamas have long been grown in Europe, but it is not known when this variety was introduced into the United States. During recent years a limited acreage of it has been grown in Oregon, principally in Clackamas County, and in New Mexico.

Limited experiments with the Clackamas variety have not shown it to be of particular promise. Apparently it is not suitable for making bread or macaroni, and its cultivation could be profitably discontinued.

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